CLAIMS

WE CLAIM:

1. A combination of a laminate (400) and a substrate (450, 650) comprising:

a substrate (450, 650); and

a laminate (400) joined to said substrate (450, 650) at a seam (500), the laminate (400)
having a first layer (5) comprising a waterproof functional layer (10, 20), and a second layer (30) laminated to said first layer (5) and comprising at least a first component and a second component, the first component being stable to a first temperature and the second component melting at a second temperature, wherein the first temperature is higher than the second temperature.

2. The combination of claim 1, whereby the seam (500) withstands a water entry pressure of at least 0.07 bar.

3. The combination of claim 1, whereby the seam (500) withstands a water entry pressure of at least 0.13 bar.

4. The combination of claim 1, whereby the stiffness of the seam (500) is less than 50 mm^{-1}.

5. The combination of claim 1, whereby the shrinkage of the seam (500) is less than 7%.

6. The combination of claim 1, whereby the seam (500) has a width less than 0.25 cm.

7. The combination of claim 1 whereby the seam (500) has an elongation strain at break of greater than 75%.

8. The combination of claim 1, whereby the seam (500) has a transverse seam strength of greater than 3 pli.

9. The combination of claim 1, whereby the second layer (30) further includes a propellant which is activatable by activation means.

10. The combination of claim 1, whereby the second component is meltable at a temperature in the range from 80°C to 170°C.

11. The combination of claim 1, whereby the first component is stable to a temperature of at least 140°C.

12. The combination of claim 1, whereby the difference in temperature between the first temperature and the second temperature is at least 20°C.

13. The combination of claim 1, wherein the second layer (30) is composed of a plurality of yarns in the form of strands, filaments, threads or fibers.

14. The combination of claim 1, wherein the second layer (30) is a knitted, woven or non-woven layer.

15. The combination of claim 1, wherein the first component is selected from the group of polymers comprising polyolefins including polypropylene and polyethylene, polyester, co-polyester, polyamide, co-polyamide, cellulose or protein fibers including wool and silk.

16. The combination of claim 15, wherein the first component is polyamide 6.6.

17. The combination of claim 1, wherein the second component is a thermoplastic.

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29. The combination of claim 9, wherein the propellant is selected from the group of propellants consisting of azodicarbonamide, ammonium hydrogen carbonate, toluolsulfohydrazin or diazoaminobenzol.

30. The combination of claim 18, wherein the propellant is azodicarbonamide.

31. The combination of claim 1, wherein the functional layer (5) is a membrane or a film.

32. The combination of claim 20, wherein the functional layer (5) is selected from the group of materials consisting of polyesters, polyamide, polyolefins, polyvinylchloride, polyketones, polysulfones, polycarbonates, fluoropolymers including polytetrafluoroethylene (PTFE), polyacrylates, polyurethanes, co-polyetheresters, co-polyetheramides.

33. The combination of claim 21, wherein the functional layer (5) is made from expanded PTFE.

34. The combination of claim 1, wherein the MVTR of the laminate (400) is less than 150 RET.

35. The combination of claim 1, wherein the water entry pressure of a laminate (400) is greater than 0.13 bar.

36. Articles of clothing made from the combination of claims 1 to 24.

37. A combination of two laminates (400, 450, 650) joined together at a seam (500), each of the laminate (400, 450, 460) comprises:

a first layer (5) comprising a waterproof functional layer (10, 20), and

a second layer (30) laminated to said first layer (5) and comprising at least a first component and a second component, the first component being stable to a first temperature and the second component melting at

a second temperature, wherein the first temperature is higher than the second temperature.

38. The combination of claim 37, whereby, the seam (500) withstands a water entry pressure of at least 0.07 bar.

39. The combination of claim 37, whereby the seam (500) withstands a water entry pressure of at least 0.13 bar.

40. The combination of claim 37, whereby the seam (500) has a width less than 0.25 cm.

41. The combination of claim 37, whereby the seam (500) has an elongation strain at break of greater than 75%.

42. The combination of claim 37, whereby the seam (500) has a transverse seam strength of greater than 3 pli.

43. The combination of claim 37, whereby the stiffness of the seam (500) is less than 50 mm^{-1}.

44. The combination of claim 37, whereby the shrinkage of the seam (500) is less than 7%.

45. The combination of claim 37, whereby the second layer further includes a propellant which is activatable by activation means.

46. The combination of claim 37, whereby the second component is meltable at a temperature in the range from 80°C to 170°C.

47. The combination of claim 37, whereby the first component is stable to a temperature of at least 140°C.

48. The combination of claim 37, whereby the difference in temperature

between the first temperature and the second temperature is at least 20°C.

49. The combination of claim 37, wherein the second layer (30) is composed of a plurality of yarns in the form of strands, filaments, threads or fibers.

50. The combination of claim 37, wherein the first component is selected from the group of polymers comprising cellulose, protein fibers including wool and silk, polyolefins including polypropylene and polyethylene, polyester, co-polyester, polyamide, or co-polyamide.

51. The combination of claim 50, wherein the first component is polyamide 6.6.

52. The combination of claim 37, wherein the second component is a thermoplastic.

53. The combination of claim 52, wherein the second component is selected from the group of thermoplastics comprising co-polyester, polyamide, co-polyamide or polyolefin including polyethylene and polypropylene.

54. The combination of claim 53, wherein the second component is a polyethylene.

55. The combination of claim 54, wherein the second component is a polyamide 6.0.

56. The combination of claim 49, wherein the yarn has a bicomponent structure comprising the first component and the second component.

57. The combination of claim 56, wherein the yarn has a sheath-core structure, wherein the second component forms the cover.

58. The combination of claim 56, wherein the yarn has a "side-by-side"

structure.

59. The combination of claim 37, wherein the second component is a blend of yarns.

60. The combination of claim 59, wherein the yarn is comprised of fibers.

61. The combination of claim 45, wherein the propellant after activation generates a closed cell foam with the second component after melting.

62. The combination of claim 45, wherein the propellant is activated at a third temperature, the third temperature being intermediate between the second temperature and the first temperature.

63. The combination of claim 45, wherein the propellant is an integral part of the second component.

64. The combination of claim 45, wherein the propellant is selected from the group of propellants consisting of azodicarbonamide, ammonium hydrogen carbonate, toluolsulfohydrazin or diazoaminobenzol.

65. The combination of claim 64, wherein the propellant is azodicarbonamide.

66. The combination of claim 37, wherein the functional layer (5) is a membrane or a film.

67. The combination of claim 66, wherein the functional layer (5) is selected from the group of materials consisting of polyesters, polyamide, polyolefins, polyvinylchloride, polyketones, polysulfones, polycarbonates, fluoropolymers including polytetrafluoroethylene, polyacrylates, polyurethanes, co-polyetheresters, co-polyetheramides.

68. The combination of claim 67, wherein the functional layer (5) is made

from expanded PTFE.

69. The combination of claim 37, wherein the MVTR of the laminate (1) is greater than 3000 m^2 / 24 hr.

70. The combination of claim 37, wherein the water entry pressure of a laminate (1) is greater than 0.13 bar.

71. The combination of one of claims 37 to 70, in a garment.

72. A combination of two waterproof laminates (400, 450, 650), each having a functional layer (10, 20) laminated to a textile layer (30), and being joined together at a welded seam (500), wherein the seam (500) has a transverse seam strength of greater than 3 pli and an elongation strain at break greater than 75%.

73. The combination of claim 72, wherein the seam (500) has a width of less than 0.25 cm.

74. The combination of claim 72, wherein the stiffness of the seam (500) is less than 50 mm^{-1}.

75 The combination of claim 72, wherein the seam (500) withstands water pressure of 0.13 bar for at least three minutes.

76. The combination of claim 72, wherein the seam (500) shrinks by less than 7% after welding.

77. A combination of two waterproof laminates (400, 450, 650), each having a functional layer (10, 20) laminated to a textile layer (30), and being joined together at a welded seam (500), wherein the seam (500) has a transverse seam strength of greater than 3 pli and wherein the stiffness of the seam (500) is less than 50 mm^{-1}.

78 The combination of claim 77, wherein the seam (500) has a width of less than 025 cm.

79 The combination of claim 77, wherein elongation strain at break is greater than 75%.

80 The combination of claim 77, wherein the seam (500) withstands a water pressure of 0.13 bar for at least three minutes

81 Method for sealing a pinhole (800) in a laminate (810) having a waterproof and breathable functional layer (10, 20) laminated to a textile layer (30) comprising the following steps:

-detection of the pinhole (800).

-heating the laminate (810) to a temperature within the melting range of one or more of the components of the laminate (810) such that the one or more component flows and seals said pinhole (800).

82 Method according to claim 81, wherein said textile layer (30) is made of a plurality of conjugate yarns.

83 Method according to claim 81, wherein said textile layer (30) is heated to a temperature within the melting range of one or more of the components of the textile layer (30) such that the one or more of the components of the textile layer (30) flows and seals said pinhole (800).